# Mthsc 301: Statistical Methods Test 1 <br> Closed Book/Notes 

September 13, 1999

1. The Figure 1 (attached) gives the relative frequency curves constructed from two sets of breaking service mileage (in thousands of miles) for Toyotas. The curve given in $* * * *$ indicates the curve for distances for 100 randomly selected cars with metallic pads and the curve given in ---- indicates the service mileage for similar 100 cars with composite pads. You are interested in examining the similarities and differences in the service mileage.
(a) Do metallic pads seem to improve the break life? Explain.
(b) Would many composite breaks last more than 20000 miles?Explain.
(c) In a Q-Q plot, which data exhibit near linearity? Why?
(d) The mileages are known to be normally distributed. If the average mileage with metallic pads are 19000 miles with a standard deviation of 5000 miles, what proportion of metallic breaks would have to be serviced between 12000 and 23000 miles
(e) What is the mileage at which $5 \%$ of all metallic pads would have to be replaced?
2. Grocery bills for fifteen shoppers were recorded to the nearest dollar. Determine the median of the bills and determine whether there were any outliers in this collection. $66,78,77,60,91,67,79,67,76,84,72,68,64,66,123$.
3. The Box-Whisker plots in Figure 2 (attached) give two side by side plots of the fat content as a $\%$ of the weight for two types of fried chicken nuggets.
(a) Indicate one similarity and one discrepancy between the two brands.
(b) Which brand would be healthy? Why?
(c) The manufacturer of brand A claims that the chances of their nuggets having a fat content exceeding $7 \%$ is less than $10 \%$. Would you agree? Why?
(d) The brand A nuggets are heavier than brand B nuggets. Would this additional information change your opinion above? Why?
4. The scores in an aptitude test are normally distributed with a mean 100 and a standard deviation 10 .
(a) Find the probability that a student scores more than 123
(b) Find the probability that a student scores between 85 and 110.
(c) Find the number $c$ such that $95 \%$ of the students would have their scores below $c$.
